Chapter 7 Ionic and Metallic Bonding

1. What are valence electrons?

2. The valence electrons largely determine the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of an element are usually the only electrons used in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

3. Is the following true or false? The group number of an element in the periodic table is related to the number of the valence electrons.

4. What is an electron dot structure?

5. Draw the electron dot structure for the following: Ar, Ca, and I.

6. What is the octet rule?

7. Metallic atoms tend to lose their valence electrons to produce a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Most Nonmetallic atoms achieve a complete octet by gaining or \_\_\_\_\_\_\_\_\_\_\_\_\_\_electrons.

8. Atoms of most nonmetallic elements achieve noble-gas electron configurations by gaining electrons to become \_\_\_\_\_\_\_\_\_\_\_\_, or negativity charged ions.

9. What property of nonmetallic elements makes them more likely to gain electrons than lose electrons?

10. Is the following true or false? Elements of the halogen family lose one electron to become halide ions.

11. How many electrons will each element gain in forming an ion?

1. Nitrogen
2. Oxygen
3. Sulfur
4. Bromine

12. Write the symbol and electron configuration for each ion. Name the noble gas with the same configuration.

1. Nitride
2. Oxide
3. Sulfide
4. Bromide

13. What is an ionic bond?

14. In an ionic compound, the charges of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ must balance to produce an electrically \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ substance.

15. Explain why Be and F combine in a 1:2 ratio.

16. A chemical formula shows the types and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of atoms in the smallest representative unit of a substance.

17. List the numbers and types of atoms represented by these chemical formulas.

1. Fe2O3
2. KMnO4
3. CH3
4. NH4NO3

18. Describe the structure of ionic compounds.

19. Is the following true or false? Ionic Compounds generally have low melting points.

20. Circle the letter of each statement that is true about ionic compounds

1. When dissolved in water, ionic compounds can conduct electricity.
2. When melted, ionic compounds do not conduct electricity.
3. Ionic compound have very unstable structures.
4. Ionic compounds are electrically neutral.

21. Is the following true or false? Metals are made up of cations, not neutral atoms.

22. What are metallic bonds?

23. Name three properties of metals that can be explained by metallic bonding.

24. What happens to a crystal when force is applied to it?

25. Metal atoms in crystals are arranged into very \_\_\_\_\_\_\_\_\_\_\_\_ and orderly patterns